

## **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Previously presented) A supported catalyst system suitable for the polymerisation of olefins comprising

(a) metallocene having the formula:



wherein Cp is a single cyclopentadienyl or substituted cyclopentadienyl group optionally covalently bonded to M through a substituent, M is a Group VIA metal bound in a  $\eta^5$  bonding mode to the cyclopentadienyl or substituted cyclopentadienyl group, X each occurrence is hydride or a moiety selected from the group consisting of halo, alkyl, aryl, aryloxy, alkoxy, alkoxyalkyl, amidoalkyl, and siloxyalkyl having up to 20 non-hydrogen atoms and neutral Lewis base ligands having up to 20 non-hydrogen atoms or optionally one X together with Cp forms a metallocycle with M and n is dependent upon the valency of the metal,

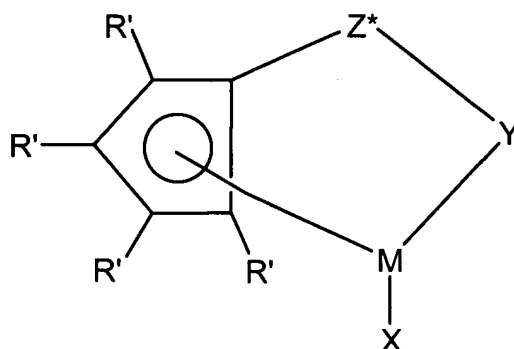
(b) a non-aluminoxane activator, and

(c) a support material comprising an inorganic metal oxide, inorganic metal halide or polymeric material or mixtures thereof, wherein the support material has been pretreated with an  $\text{SO}_4$  containing compound.

2. (Original) A supported catalyst system according to claim 1 wherein the support material is silica.

3-4. (Cancelled).

5. (Currently amended) A supported catalyst system according to claim 1 wherein the metallocene is represented by the general formula:



wherein:

R' each occurrence is independently selected from hydrogen, hydrocarbyl, silyl, germyl, halo, cyano, **[[and]]** or combinations thereof, said R' having up to 20 nonhydrogen atoms, and optionally, two R' groups (where R' is not hydrogen, halo or cyano) together form a divalent derivative thereof connected to adjacent positions of the cyclopentadienyl ring to form a fused ring structure;

X is a neutral **[[in a]]**  $\eta^4$  bonded diene group having up to 30 non-hydrogen atoms, which forms a  $\pi$ -complex with M;

Y is -O-, -S-, -NR<sup>\*</sup>-, -PR<sup>\*</sup>-,

M is titanium or zirconium in the + 2 formal oxidation state;

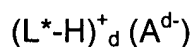
Z<sup>\*</sup> is SiR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup><sub>2</sub>, SiR<sup>\*</sup><sub>2</sub>SiR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup><sub>2</sub>CR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup>=CR<sup>\*</sup>, CR<sup>\*</sup><sub>2</sub>SiR<sup>\*</sup><sub>2</sub>, or GeR<sup>\*</sup><sub>2</sub>,

wherein:

R\* each occurrence is independently hydrogen, or a member selected from hydrocarbyl, silyl, halogenated alkyl, halogenated aryl, and or combinations thereof, said

R\* having up to 10 non-hydrogen atoms, and optionally, two R\* groups from Z\* (when R\* is not hydrogen), or an R\* group from Z\* and an R\* group from Y form a ring system.

6. (Previously presented) A supported catalyst system according to claim 1 or 2 wherein the activator is represented by the formula:



wherein

L\* is a neutral Lewis base

$(L^*-H)^+_d$  is a Bronsted acid

A<sup>d-</sup> is a non-coordinating compatible anion of a Group IIIA metal or metalloid having a charge of d<sup>-</sup>, and

d is an integer from 1 to 3.

7. (Original) A supported catalyst composition according to claim 6 wherein the anion comprises a boron metal.

8. (Original) A supported catalyst system according to claim 6 wherein the activator comprises a cation and an anion wherein the anion has at least one substituent comprising a moiety having an active hydrogen.

9. (Previously presented) A supported catalyst system according to claim 1 wherein the SO<sub>4</sub> containing compound is a transition metal sulphate.

10. (Original) A supported catalyst system according to claim 9 wherein the transition metal sulphate is a sulphate of iron or copper.

11. (Previously presented) A supported catalyst system according to claim 1 wherein the SO<sub>4</sub> containing compound is ammonium sulphate or sulphuric acid.

12. (Currently amended) A process for the polymerisation of olefin ~~monomers~~ monomer(s) selected from (a) ethylene, (b) propylene (c) mixtures of ethylene and propylene ~~[[and]]~~ or (d) mixtures of (a), (b) or (c) with one or more other alpha-olefins, ~~said process performed~~ comprising polymerising said olefin monomer(s) under polymerisation conditions in the presence of a supported catalyst system according to claim 1.

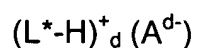
13. (Currently amended) A process for the polymerisation of ethylene or the copolymerisation of ethylene and an alpha-olefin ~~alpha-olefins~~ having from 3 to 10 carbon atoms, ~~said process performed~~ comprising polymerising said ethylene or ethylene and an alpha-olefin under polymerisation conditions in the presence of a supported catalyst system according to claim 1.

14. (Currently amended) A process according to claim 12 wherein the alpha-olefins are 1-butene, 1-hexene, 4-methyl-1-pentene ~~[[and]]~~ or 1-octene.

15. (Previously presented) A process according to claim 12 which is carried out in the gas phase.

16. (Previously presented) A supported catalyst system suitable for the polymerisation of olefins comprising

- (a) a transition metal compound,
- (b) an activator represented by the formula:



wherein

L\* is a neutral Lewis base

$(L^*-H)^+_d$  is a Bronsted acid

$A^{d-}$  is a non-coordinating compatible anion of a Group IIIA metal or metalloid having a charge of  $d^-$ , and

$d$  is an integer from 1 to 3, and

(c) a support material comprising an inorganic metal oxide, inorganic metal halide or polymeric material or mixtures thereof, wherein the support material has been pretreated with an  $SO_4$  containing compound.

17. (Previously presented) A supported catalyst system according to claim 16 wherein the support material is silica.

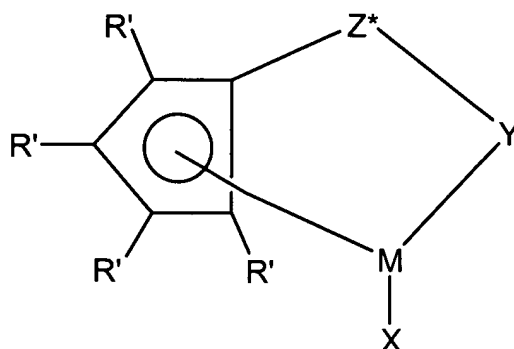
18. (Previously presented) A supported catalyst system according to claim 16 or 17 wherein the transition metal compound is a metallocene.

19. (Previously presented) A supported catalyst system according to claim 18 wherein the metallocene has the formula:



wherein Cp is a single cyclopentadienyl or substituted cyclopentadienyl group optionally covalently bonded to M through a substituent, M is a Group VIA metal bound in a  $\eta^5$  bonding mode to the cyclopentadienyl or substituted cyclopentadienyl group, X each occurrence is hydride or a moiety selected from the group consisting of halo, alkyl, aryl, aryloxy, alkoxy, alkoxyalkyl, amidoalkyl, and siloxyalkyl having up to 20 non-hydrogen atoms and neutral Lewis base ligands having up to 20 non-hydrogen atoms or optionally one X together with Cp forms a metallocycle with M and  $n$  is dependent upon the valency of the metal.

20. (Currently amended) A supported catalyst system according to claim 18 wherein the metallocene is represented by the general formula:



wherein:

R' each occurrence is independently selected from hydrogen, hydrocarbyl, silyl, germyl, halo, cyano, **[[and]]** or combinations thereof, said R' having up to 20 nonhydrogen atoms, and optionally, two R' groups (where R' is not hydrogen, halo or cyano) together form a divalent derivative thereof connected to adjacent positions of the cyclopentadienyl ring to form a fused ring structure;

X is a neutral **[[in a]]**  $\eta^4$  bonded diene group having up to 30 non-hydrogen atoms, which forms a  $\pi$ -complex with M;

Y is -O-, -S-, -NR<sup>\*</sup>-, -PR<sup>\*</sup>-,

M is titanium or zirconium in the + 2 formal oxidation state;

Z<sup>\*</sup> is SiR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup><sub>2</sub>, SiR<sup>\*</sup><sub>2</sub>SiR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup><sub>2</sub>CR<sup>\*</sup><sub>2</sub>, CR<sup>\*</sup>=CR<sup>\*</sup>, CR<sup>\*</sup><sub>2</sub>SiR<sup>\*</sup><sub>2</sub>, or GeR<sup>\*</sup><sub>2</sub>,

wherein:

R<sup>\*</sup> each occurrence is independently hydrogen, or a member selected from hydrocarbyl, silyl, halogenated alkyl, halogenated aryl, **[[and]]** or combinations thereof, said

R\* having up to 10 non-hydrogen atoms, and optionally, two R\* groups from Z\* (when R\* is not hydrogen), or an R\* group from Z\* and an R\* group from Y form a ring system.

21. (Previously presented) A supported catalyst composition according to claim 16 wherein the anion comprises a boron metal.

22. (Previously presented) A supported catalyst system according to claim 16 wherein the activator comprises a cation and an anion wherein the anion has at least one substituent comprising a moiety having an active hydrogen.

23. (Previously presented) A supported catalyst system according to claim 16 wherein the SO<sub>4</sub> containing compound is a transition metal sulphate.

24. (Previously presented) A supported catalyst system according to claim 23 wherein the transition metal sulphate is a sulphate of iron or copper.

25. (Previously presented) A supported catalyst system according to claim 16 wherein the SO<sub>4</sub> containing compound is ammonium sulphate or sulphuric acid.

26. (Currently amended) A process for the polymerisation of olefin ~~monomers~~ monomer(s) selected from (a) ethylene, (b) propylene (c) mixtures of ethylene and propylene ~~[[and]]~~ or (d) mixtures of (a), (b) or (c) with one or more other alpha-olefins, ~~said process performed~~ comprising polymerising said olefin monomer(s) under polymerisation conditions in the presence of a supported catalyst system according to claim 16.

27. (Currently amended) A process for the polymerisation of ethylene or the copolymerisation of ethylene and an alpha-olefin ~~alpha-olefins~~ having from 3 to 10 carbon atoms, ~~said process performed~~ comprising polymerising said ethylene or

ethylene and an alpha-olefin under polymerisation conditions in the presence of a supported catalyst system according to claim 16.

28. (Currently amended) A process according to claim 26 wherein the alpha-olefins are 1-butene, 1-hexene, 4-methyl-1-pentene ~~[[and]]~~ or 1-octene.

29. (Previously presented) A process according to claim 26 which is carried out in the gas phase.